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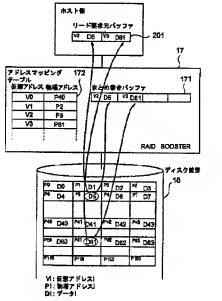
(71) Applicant: TOSHIBA CORP
(72) Inventor: MOTOSAWA KUNIAKI

(54) DISK CONTROL SYSTEM AND DATA REARRANGING METHOD

(57) Abstract:

PROBLEM TO BE SOLVED: To remarkably enhance the reading performance by efficiently rearranging data in a disk control system in a log structuring writing system.

SOLUTION: When a read request is generated to plural blocks (virtual addresses V2, V3) with continuous virtual addresses, physical addresses (p5, p81) of the blocks are calculated from an address mapping table 171 and read from a disk device 18. The blocks (data D5, D81) read from the physical addresses are transferred to a buffer 201 at a read requesting origin and written back in a bulk writing buffer 171. When a free space is not available in the bulk writing buffer 171, the contents of the bulk writing buffer 171 is written in the disk device 18 and pieces of data with continuous virtual addresses are stored in the disk device 18 again so that their physical addresses also becomes continuous.



(citation 5)

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Inventor: Kuniaki MOTOSAWA
Applicant: TOSHIBA Corporation

Title of the Invention: Disk Control System and Data Rearranging Method

(Claim 1)

A disk control system of a log-structured writing scheme, wherein write data is accumulated in a buffer (171) and a plurality of write data blocks accumulated in the buffer are collectively written on a disk device (18) in stripes, each of which is formed of a plurality of contiguous storage areas of the disk device (18), characterized by comprising:

control means (17) operative such that, when a read request is generated to a plurality of blocks having successive virtual addresses, the requested plurality of blocks are transferred to a read request source, and the plurality of data blocks are written back to the disk device (18) so that they have successive physical addresses or stored in the same stripe.

(Abridgment of the description)

With reference to Fig. 4, in response to the reception of a read request for data blocks D5 and D81 having successive virtual addresses V2 and V3 from a disk device 18, a RAID booster 17 retrieves the requested data blocks D5 and D81 from the disk device 18. In this example, they are retrieved from physical addresses P5 and P81 of the disk device 18, by using a mapping table 172. Then, the retrieved data blocks D5 and D81 are transferred to the requesting element 201, and also stored on a burst writing buffer 171, as shown in Fig. 5. If the burst writing buffer 171 is completely filled with data blocks as shown in Fig. 6, the contents of the burst writing buffer 171 are written back to the disk device 18 such that they are stored at successive physical addresses P100-P103 on the disk device 18. In response, the mapping table 172 is also updated accordingly.